

Remarks

This is in response to the Official Action of December 7, 2009. The issues raised therein are addressed below in the order originally set forth.

Claims 3, 15, 20, 22-27, and 47 have been withdrawn from further consideration by the Examiner as being drawn to a nonelected species. Claims 1, 10, and 32-50 have been cancelled and claims 2-9, 11-18, and 20-28 have been amended.

New claims. New claim 51 corresponds to previously presented claims 28-31, and is added to complete the record. A claim commensurate with new claim 51 has not previously been presented, and consideration thereof is respectfully requested. New claims 52-59 correspond to previously presented claims 20-27, except that they depend upon claim 51. These claims are added to complete the record.

Claim rejections — 35 USC § 103.

Claims 1-2, 4-9, 11-14, 16, 18-19, 21, 32-39, 41-46, 48, and 50 stand rejected as allegedly being obvious under 35 USC § 103(a) over **Chapman et al.** in view of **Hawker et al.** and **Zhang et al.** To narrow and simplify the issues, claims 1, 32-39, 41-46, 48 and 50 have been cancelled and claims 2, 4-9, 11-14, 16, 18-19, and 21 have been amended. Accordingly, it is respectfully submitted that this rejection is now moot and should be withdrawn.

Claims 1 and 28-31 stand rejected as allegedly being obvious under 35 USC § 103(a) over **Chapman et al.** in view of **Hawker et al.** and **Zhang et al.**, as applied above, and further in view of **Healy**. To narrow and simplify the issues, claim 1 has been cancelled, without prejudice or disclaimer. Claim 28 has been rewritten in independent form. This rejection is respectfully traversed for the reasons set forth below.

Chapman et al. describes applying a self-assembled monolayer on gold to provide reactive groups, to which pre-formed polymer is then attached, and to which kosmotropes are in turn attached. Thus, Chapman's goal is to create something other than brush polymers.

Hawker et al. grows a film *in situ* on a surface, but is not concerned with applying protein-resistance to a surface. .

Zhang et al. is the opposite of Hawker et al., in that Zhang is concerned with free-standing films or films coated on (essentially painted on) a surface. Hence Zhang's goal is to

create something other than brush polymers. One skilled in the art would not be motivated to combine two opposite approaches.

Healy describes biomimetic engineering of materials, which is a class of materials that are designed to interact specifically with mammalian cells to control their behavior and subsequently direct the formation of organ specific tissue.

Applicants respectfully submit that the above-cited references do not teach or suggest a method of using an article having a nonfouling surface thereon, comprising: *(a)* providing an article having a nonfouling surface thereon, comprising: *(i)* a substrate having a surface portion; *(ii)* a linking layer on said surface portion; and *(iii)* a polymer layer formed on said linking layer by the process of surface-initiated polymerization of monomeric units thereon, with each of said monomeric units comprising a vinyl monomer core group having at least one protein-resistant head group coupled thereto, to thereby form a brush molecule on said surface portion; said brush molecule comprising a stem formed from the polymerization of said monomer core groups, and a plurality of branches formed from said protein-resistant head group projecting from said stem; and then *(b)* contacting said article to a biological fluid, and where proteins in said fluid do not bind to said surface portion.

Accordingly, Applicants respectfully traverse this rejection. As stated in the recently published Examination Guidelines for Determining Obviousness, "the Supreme Court reaffirmed the familiar framework for determining obviousness as set forth in *Graham v. John Deere Co....*" (Examination Guidelines for Determining Obviousness Under 35 U.S.C 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.* Federal Register Vol. 72, No. 195, 57526-57535, 57526). Hence, as long established under that framework, to establish a *prima facie* case of obviousness, three requirements must be satisfied (M.P.E.P. § 2143). First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. *In re Oetiker*, 24 U.S.P.Q.2d 1443, 1446 (Fed. Cir. 1992); *In re Fine*, 837 F.2d at 1074; *In re Skinner*, 2 U.S.P.Q.2d 1788, 1790 (Bd. Pat. App. & Int. 1986). Second, the proposed modification or combination of the prior art must have a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *See Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1209, 18 U.S.P.Q.2d 1016, 1023 (Fed. Cir. 1991). Third, the prior art reference or combination of

references must teach or suggest all of the limitations of the claims. See *In re Wilson* 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art").

Furthermore, rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *KSR Int'l vs. Teleflex, Inc.*, 550 U.S. 398, at 418, 82 USPQ2d at 1396 quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art. *KSR International Co. v. Teleflex Inc.*, 550 U.S. at 418, 82 USPQ2d, at 1396.

Applicants traverse this rejection and respectfully submit that a prima facie case of obviousness has not been set forth that it was more probable than not that one of ordinary skill in the art would have been motivated or directed to perform the claimed method based upon the teachings of **Chapman et al.** in view of **Hawker et al.** and **Zhang et al.**, as applied above, and further in view of **Healy**.

Specifically, none of the cited references teach or suggest a method of using an article having a nonfouling surface thereon as claimed in claim 28, wherein the article is contacted with a biological fluid and where proteins in the fluid do not bind to the surface portion of the article. The Examiner in particular notes that neither Chapman et al., Zhang et al., nor Hawker et al. teach that the article is exposed to a particular biological fluid for a specified period of time. (Office Action, Page 8). Healy is concerned with materials that are designed to interact specifically with mammalian cells to control their behavior and subsequently direct the formation of organ specific tissue. These materials are designed to interact specifically with mammalian cells through biomolecular recognition events. As the Examiner states Healy describes covalently linking RGD peptide sequences to the surface of protein resistant coatings to facilitate certain cell interactions. (Office Action, Page 8). As Healy describes the peptide modified surfaces are designed to prevent non-specific adsorption of macromolecules, but are designed to promote specific cellular interactions. (Healy, page 383, column 2, first full paragraph). These specific interactions include the binding of specific proteins to enhance cell adhesion to the material. (Healy, page 384, column 1, first paragraph). Accordingly, Applicants respectfully

submit that the above-cited references fail to teach or suggest all limitations of the claimed invention.

Additionally, Applicants respectfully submit that there is no incentive or suggestion to one skilled in the art to combine the above-cited references. Chapman et al., Hawker et al., Zhang et al., and Healy have significantly different goals, which are achieved by significantly different techniques. Specifically, Hawker et al. and Zhang et al. are opposite approaches. Healy does not teach or suggest a surface comprising brush polymers and instead describes PEG surfaces. Furthermore, Healy in describing the adsorption of proteins on SAMs to control cell behavior states that caution should be used in interpreting the *in vivo* results since the stability of self-assembled monolayers based on gold-thiol chemistry has not been determined *in vivo*. (Healy, page 382, column 1, first paragraph). Therefore, one skilled in the art would not be motivated to combine the SAMs taught in Chapman et al. and Hawker et al. with Healy. Hence, it is respectfully submitted that a person of ordinary skill in the art would not be motivated to combine these references to achieve the presently claimed invention.

Moreover, Applicants respectfully submit that since there is no incentive or suggestion to combine the above-cited references, one skilled in the art would not have a reasonable expectation of success to combine the above cited references. As the Examiner notes neither Chapman et al., Zhang et al., nor Hawker et al. teach that the article is exposed to a particular biological fluid for a specified period of time. (Office Action, Page 8). As discussed above, Healy does not cure this deficiency. Accordingly, one skilled in the art would not have a reasonable expectation of success to perform the claimed method based upon the teachings of the above-cited references.

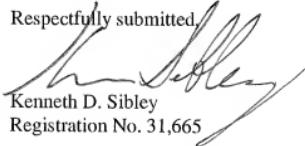
For at least the reasons discussed above, it is respectfully submitted that a *prima facie* case of obviousness has not been shown. Therefore, Applicants respectfully submit that claims 28-31 are patentable over **Chapman et al.** in view of **Hawker et al.** and **Zhang et al.**, as applied above, and further in view of **Healy**. Thus, withdrawal of this rejection is respectfully requested.

Claims 1, 17, 33, and 39 stand rejected as allegedly being obvious under 35 USC § 103(a) over **Chapman et al.** in view of **Hawker et al.** and **Zhang et al.**, as applied above, and further in view of **Leckband et al.** To narrow and simplify the issues, claims 1, 33, and 39 have been cancelled and claim 17 has been amended. Accordingly, it is respectfully submitted that this rejection is now moot and should be withdrawn.

Claims 33 and 40 stand rejected as allegedly being obvious under 35 USC § 103(a) over **Chapman et al.** in view of **Hawker et al.** and **Zhang et al.**, as applied above, and further in view of **Guan et al.** To narrow and simplify the issues, claims 33 and 40 have been cancelled. Accordingly, it is respectfully submitted that this rejection is now moot and should be withdrawn.

It is respectfully submitted that this application is in condition for allowance, which action is respectfully requested.

Respectfully submitted,



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